absence. In the target absence trials, the reaction times of all the subjects displayed a direct correspondence to the number of distractors whilst the target present trials did not display any such dependency. Furthermore, it was found that the reaction times in instances where distractors were spread across multiple depths were faster than for distractors located in a single depth plane.

[0012] Consequently, the use of a plurality of depth/focal planes as a means of displaying information can enhance preattentive processing with enhanced reaction/assimilation times.

[0013] There are two main types of Liquid Crystal Displays used in computer monitors, passive matrix and active matrix. Passive-matrix Liquid Crystal Displays use a simple grid to supply the charge to a particular pixel on the display. Creating the grid starts with two glass layers called substrates. One substrate is given columns and the other is given rows made from a transparent conductive material. This is usually indium tin oxide. The rows or columns are connected to integrated circuits that control when a charge is sent down a particular column or row. The liquid crystal material is sandwiched between the two glass substrates, and a polarizing film is added to the outer side of each substrate.

[0014] A pixel is defined as the smallest resolvable area of an image, either on a screen or stored in memory. Each pixel in a monochrome image has its own brightness, from 0 for black to the maximum value (e.g. 255 for an eight-bit pixel) for white. In a colour image, each pixel has its own brightness and colour, usually represented as a triple of red, green and blue intensities. To turn on a pixel, the integrated circuit sends a charge down the correct column of one substrate and a ground activated on the correct row of the other. The row and column intersect at the designated pixel and that delivers the voltage to untwist the liquid crystals at that pixel.

[0015] The passive matrix system has significant drawbacks, notably slow response time and imprecise voltage control. Response time refers to the Liquid Crystal Displays ability to refresh the image displayed. Imprecise voltage control hinders the passive matrix's ability to influence only one pixel at a time. When voltage is applied to untwist one pixel, the pixels around it also partially untwist, which makes images appear fuzzy and lacking in contrast.

[0016] Active-matrix Liquid Crystal Displays depend on thin film transistors (CIF). Thin film transistors are tiny switching transistors and capacitors. They are arranged in a matrix on a glass substrate. To address a particular pixel, the proper row is switched on, and then a charge is sent down the correct column. Since all of the other rows that the column intersects are turned off, only the capacitor at the designated pixel receives a charge. The capacitor is able to hold the charge until the next refresh cycle. And if the amount of voltage supplied to the crystal is carefully controlled, it can be made to untwist only enough to allow some light through. By doing this in very exact, very small increments, Liquid Crystal Displays can create a grey scale. Most displays today offer 256 levels of brightness per pixel.

[0017] A Liquid Crystal Display that can show colours must have three subpixels with red, green and blue colour filters to create each colour pixel. Through the careful control and variation of the voltage applied, the intensity of each subpixel can range over 256 shades. Combining the subpixel produces a possible palette of 16.8 million colours (256 shades of red ×256 shades of green ×256 shades of blue).

[0018] Liquid Crystal Displays employ several variations of liquid crystal technology, including super twisted nematics, dual scan twisted nematics, ferroelectric liquid crystal and surface stabilized ferroelectric liquid crystal. They can be lit using ambient light in which case they are termed as reflective, backlit and termed Tran missive, or a combination of backlit and reflective and called transflective. There are also emissive technologies such as Organic Light Emitting Diodes, and technologies which project an image directly onto the back of the retina which are addressed in the same manner as Liquid Crystal Displays. These devices are described hereafter as LCD panels.

[0019] In the case of a display comprising two or more overlapping parallel LCD panels, an inherent characteristic of using conventionally constructed LCD screens is that the polarisation of the light emanating from the front of the rearward screen is mis-aligned with the orientation of rear polariser of the front screen.

[0020] Known techniques to overcome this drawback have to date involved the use of retarder films located between the two liquid crystal displays.

[0021] Optical retarders, also known as retardation plates, wave plates and phase shifters, may be considered as polarisation form converters with close to a 100% efficiency. A retarder may be simply defined as a transrnisive material having two principle axes, slow and fast, which resolves the incident beam into two orthogonally polarised components parallel to the slow and fast axes without appreciable alteration of the of the intensity or degree of polarisation. The component parallel to the slow axis is retarded with respect to the beam component parallel to the fast axis. The two components are then reconstructed to form a single emergent beam with a specific polarisation form. The degree of retardance/retardation denoting the extent to which the slow component is retarded relative to the fast component is generally expressed in terms of

[0022] a) linear displacement—the difference in the optical path length between the wave fronts of the two components, expressed in nanometers (nm);

[0023] b) fractional wavelength—the optical path length difference expressed as a fraction of a given wavelength, obtained by dividing linear displacement values by a particular phase angle value or wavelength by 2π, e.g 280 nm/560 nm=½ wave retarder; and

[0024] c) phase angle—the phase difference between the wave fronts of the two component beams, expressed in degrees eg 90°, 180° or radians, $\frac{1}{2}7\pi$, π.

[0025] It can be thus seen that:

$$\delta=\Gamma/\lambda.2\pi$$

[0026] where δ=the phase angle

[0027] Γ=the linear displacement

[0028] λ=the wavelength

[0029] Γ/λ=is the fractional wavelength.